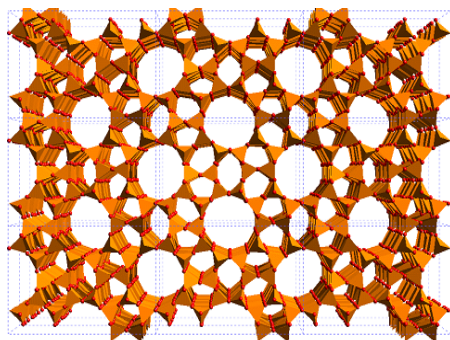


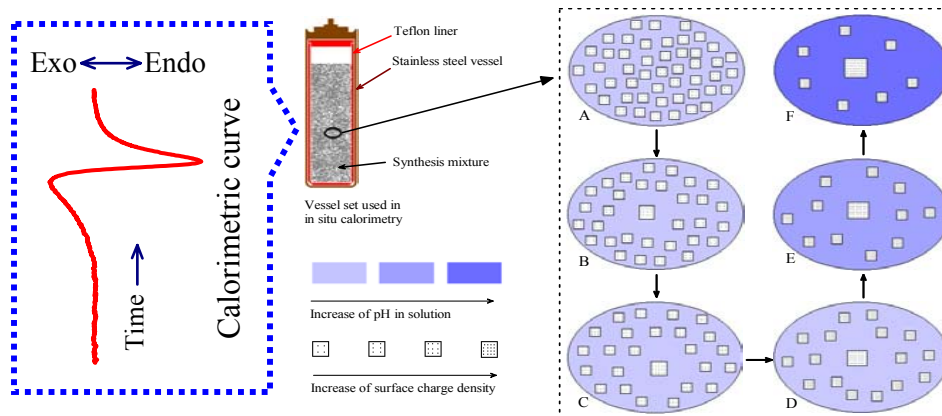
Insight into Zeolite Growth Mechanisms

Alexandra Navrotsky

University of California at Davis, DMR-01-01391



Framework structure of MFI zeolite



Zeolites are widely used in ion exchange, catalysis and separation because of their uniform cages and channels of nanometer dimensions. Design of zeolite materials for novel applications demands a detailed understanding of zeolite formation mechanisms. Here we demonstrate

Schematic representation of zeolite crystal growth by aggregation of the pre-assembled nano-precursor particles from exothermic stage to endothermic stage.

that *in situ* calorimetry reveals a two-stage crystallization process for MFI-type zeolite.

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Significance to Science and Technology

Nearly half of the gasoline we use has seen the inside of a zeolite catalyst.

Laundry detergents contain zeolites as ion exchangers. Zeolites are natural minerals and may help retard contaminant transport, including from nuclear waste. The PI and her group are helping develop the growing interdisciplinary field of nanogeoscience

Education and outreach

This work is also part of an NSF IGERT on Nanomaterials in the Environment, Agriculture, and Technology, which provides interdisciplinary education to graduate students. Eric Moloy, Ph.D. student, has spent two summers as an intern at Sandia National Laboratory. The PI lectures on nanomaterials to the public, including a UC Davis Convocation address, activities at the Franklin Institute, Philadelphia, PA, and a lecture at the Exploit Science Center, Davis CA.

